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TITLE: CD-ROM READING SYSTEM AND CD-ROM READING METHOD

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ABSTRACT:

PROBLEM TO BE SOLVED: To enable retrieval of data which are written before a file additionally written with the same name onto a writable CD-ROM medium.

SOLUTION: A session information processing section 123 determines a processing target session on the basis of storage contents in a CD-ROM number of sessions storage section 124 and a read session number storage section 125, and feeds the address of a root directory back to a device driver 120. A virtual RD information management section 135 determines whether or not a final session was processed with the address of a root directory of a session which had been processed immediately before and stored in a last session RD address storage section 133, and stores information such as a pointer of each session into a virtual RD information storage section 134. In addition, the virtual RD information management section 135 realizes a virtual root directory in a higher order, and provides the virtual root directory to application software 140.

* NOTICES *

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the CD-ROM read-out system which can take out what was written the CD-ROM medium which can be added especially at the point of the file by which additional writing was carried by the same identifier about a CD-ROM read-out system, and the CD-ROM read-out approach.
[0002]
[Description of the Prior Art] Conventionally, this kind of CD-ROM read-out system is used in order to access to the CD-ROM medium which performed file updating and which can be added so that it may be indicated by JP,2-267618,A.
[0003] Drawing 10 is a drawing explaining a Prior art, and is outline logical format drawing showing the directory o the CD-ROM medium which performed file updating once, and which can be added, and the relation of a file. When drawing 10 is referred to, on this CD-ROM medium a root directory 1000 and four subdirectories (SD1, SD2, SD3, SD4) 1011, 1012, 1013, and 1014 four files (A, B, C, D) 1021, 1022, 1023, and 1024 the file (B') 1031 which update the file (B) 1022, and the added file (E) -- 1032 -- Files 1021, 1022, 1023, 1024, 1031, and 1032 (A, B, C, D, B', E) T subdirectory (SD2') 1040 to point out is formed.
[0004] And the information on the pointer in which the location of a subdirectory (SD1) 1011 and a subdirectory (SD 1012 is shown is recorded on the root directory 1000. Moreover, in a subdirectory (SD2) 1012, they are two subdirectories (SD3, SD4) 1013 and 1014. Four files 1021, 1022, 1023, and 1024 (A, B, C, D) The information on th pointer in which a location is shown is recorded. Moreover, the information on the pointer in which the location of fi files (A, B', C, D, E) 1021, 1031, 1023, 1024, and 1032 is shown is recorded on the subdirectory (SD2') 1040.
[0005] next, the condition 1050 of having written in for beginning to show in the upper right in drawing -- a root directory 1000 and four subdirectories (SD1, SD2, SD3, SD4) 1011, 1012, 1013, and 1014 Four files (A, B, C, D) 1021, 1022, 1023, and 1024 a tree structure -- a table -- it is a thing the bottom. moreover, the condition 1060 after th postscript shown in the lower right in drawing -- a root directory 1000 and four subdirectories (SD1, SD2', SD3, SD4 1011, 1040, 1013, and 1014 a tree structure with five files (A, B', C, D, E) 1021, 1031, 1023, 1024, and 1032 -- a tab -- it is a thing the bottom.
[0006] Here, the system which accesses the directory and file on this CD-ROM medium is a root directory 1000 and four subdirectories (SD1, SD2, SD3, SD4) 1011, 1012, 1013, and 1014 first. The content is read and the target directory or the information on a file is acquired. And also including the semantics in which a CD-ROM medium checks file updating or being added, the last logical sector on a CD-ROM medium is read, and it checks that the subdirectory (SD2') 1040 is written in.
[0007] Next, when it is able to be checked that the subdirectory (SD2') 1040 is written in, they are the four original subdirectories (SD1, SD2, SD3, SD4) 1011, 1012, 1013, and 1014. Inside, information, such as each directory name which it has, is compared, and it searches which was updated. And a CD-ROM read-out system accesses a target directory and a target file instead of the information on the searched subdirectory (SD2) 1012 using the information o a subdirectory (SD2') 1040.
[0008]
[Problem(s) to be Solved by the Invention] since it is not taken into consideration at all about what the file of the former mentioned above by which additional writing was carried out by the same identifier with the system by carry out CD-ROM reading appearance to the CD-ROM medium which can be added wrote in previously, there is a fault t what the file by which additional writing was carried out by the same identifier wrote in previously cannot be taken o

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[0009] the object of this invention makes it possible to take out what the file by which additional writing was carried out by the same identifier wrote in the CD-ROM medium which can be added previously, summarizes a part added a postscript as one session especially, and is in the thing which are related with the multisession CD-ROM medium which can be added repeatedly in it and for which CD-ROM reading appearance is carried out and a system and the approach of carrying out CD-ROM reading appearance are offered.

[0010]

[Means for Solving the Problem] The 1st CD-ROM read-out system of this invention The device driver which contro directly actuation of the CD-ROM read-out equipment which reads session information and data from CD-ROM, It h with the file information managerial system which takes out and manages the information on a file or a directory fro said CD-ROM through said CD-ROM read-out equipment. Said device driver The data read-out processing section which reads the data of the demanded address from said CD-ROM, The number storage section of CD-ROM session which memorizes the total number of sessions of said CD-ROM, The read-out session number storage section which memorizes the session number made into the processing object of said CD-ROM, The session information processin section which asks for the address of the root directory which determined the processing-object session based on the information acquired from said number storage section of CD-ROM sessions, and the read-out session number storag section, and was demanded from said device driver, The driver interface section which receives the instruction from said file information managerial system and software, and returns the processing result by said data read-out process section and said session information processing section is included.

[0011] Moreover, the session root directory address storage section before said file information managerial system memorizes the address of the root directory of the session processed immediately before, The virtual root directory information storage section which memorizes the address information of the root directory of each session, With the virtual root directory Research and Data Processing Department which controls the read-out session of said device driver, and processes the address information of the root directory of an object session The processing session numbe storage section which memorizes the session number which said file information managerial system is processing, T root directory / Subdirectory Information processing section which controls processing actuation of said virtual root directory Research and Data Processing Department, The file information management SI section which receives the instruction from said software and returns the processing result of said root directory / Subdirectory Information processing section is included. It is characterized by positioning and reading the root directory of all sessions to the subdirectory under a virtual root directory.

[0012] Next, the 2nd CD-ROM read-out system of this invention It replaces with said virtual root directory informat storage section and said virtual root directory Research and Data Processing Department in said 1st CD-ROM read-o system. The object Subdirectory Information storage section which memorizes object Subdirectory Information of th processed session, the subdirectory which accumulates the difference of Subdirectory Information searched for -- difference -- with an information table the subdirectory which is accumulated in quest of difference from object Subdirectory Information acquired from a root directory / Subdirectory Information processing section, and manages -- difference -- with the information table Management Department It has the session management section which controls the read-out session of a device driver, and is characterized by editing and reading the information on the object subdirectory of all sessions to one subdirectory.

[0013] next, an approach to carry out the CD-ROM reading appearance of this invention memorizes the address of th root directory in which the session processed immediately before carried out reading appearance, judges whether the last session processed, a device driver carries out reading appearance, it controls [it carries out the reading appearan of the address of a root directory by specifying the session number set as the object on a CD-ROM medium,] a sessi and is characterized by to summarize the information on the pointer in which the address of the root directory of each session is shown. Moreover, the read-out session of a device driver is controlled, the difference of Subdirectory Information which asked for and asked for the difference of object Subdirectory Information for every session is accumulated, and it is characterized by summarizing information as one subdirectory.

[0014] In this invention, a root directory and a subdirectory with the information on a file with modification, the add file, the pointer in which those locations are shown are memorized at the session (the 2nd or subsequent ones) which the multisession CD-ROM medium added. And it reads with the virtual root directory Research and Data Processing Department and the before session root directory address storage section, and the session number storage section rea the address of the root directory of all sessions, accumulates it in the virtual root directory information storage sectio and provides application software with it.

[0015] moreover, a subdirectory -- difference -- the information table Management Department and a subdirectory --

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difference -- reading appearance is carried out to an information table and the session management section, and the session number storage section carries out reading appearance of the information on the object subdirectory of all sessions, accumulates it in the object Subdirectory Information storage section, and provides application software wi it.

[0016]

[Embodiment of the Invention] Next, the gestalt of operation of the 1st of this invention is explained to a detail with reference to a drawing. Drawing 1 is the block diagram showing the configuration of the 1st of the gestalt of operatio of this invention.

[0017] When drawing 1 is referred to, it is CD-ROM100. It has three sessions (the 1st - the 3rd session), and is the C ROM medium by which additional writing is carried out twice and which can be added. moreover, CD-ROM reading appearance -- carrying out -- equipment 110 CD-ROM100 from -- it is equipment which reads session information a data. And device driver 120 CD-ROM read-out equipment 110 Actuation is controlled directly and it is CD-ROM10 It is the file information managerial system 130 about the interface for accessing. It reads and is the session change software 150. It provides.

[0018] file information managerial system 130 CD-ROM reading appearance -- carrying out -- equipment 110 mindi -- CD-ROM100 from -- the information on a file or a directory -- taking out -- managing -- application software 140 The information is offered. application software 140 File information managerial system 130 from -- the information on the file offered or a directory -- using it -- CD-ROM100 The upper data are processed. Read-out session change software 150 Device driver 120 The function to change session control directly is offered. And this device driver 120 Driver interface section 121 Data read-out processing section 122 Session information processing section 123 The number storage section 124 of CD-ROM sessions Read-out session number storage section 125 It has.

[0019] the driver interface section 121 File information managerial system 130 and reading appearance -- carrying o - session change software 150 from -- an instruction -- winning popularity -- data reading appearance -- carrying out the processing section 122 And the session information processing section 123 The processing result to depend is returned. data reading appearance -- carrying out -- the processing section 122 Device driver 120 the data of the addr demanded by receiving -- CD-ROM100 from -- it reads.

[0020] The number storage section 124 of CD-ROM sessions CD-ROM100 The total number of sessions is memoriz and it is the read-out session number storage section 125. The session number made into a processing object is memorized. the session information processing section 123 the number storage section 124 of CD-ROM sessions, an reading appearance -- carrying out -- the session number storage section 125 from -- a radical [information / which w acquired] -- a processing-object session -- determining -- device driver 120 It asks for the address of the root directo demanded by receiving.

[0021] file information managerial system 130 The file information management SI section 131 a root directory / Subdirectory Information processing section (henceforth the RD/SD information processing section) 132 the before session root directory address storage section (henceforth the before session RD address storage section) 133 Virtual root directory information storage section 134 (henceforth the virtual RD information storage section) Processing session number storage section 136 Virtual root directory Research and Data Processing Department 135 (henceforth the virtual RD Research and Data Processing Department) It has.

[0022] the file information management SI section 131 Application software 140 from -- an instruction -- winning popularity -- the RD/SD information processing section 132 A processing result is returned. the RD/SD information processing section 132 Device driver 120 from -- the information on the acquired root directory or a subdirectory -- processing -- the virtual RD Research and Data Processing Department 135 It controls. Before session RD address storage section 133 The address of the root directory of the session processed immediately before is memorized, and is mainly the virtual RD Research and Data Processing Department 135. It is used for decision whether the last sessi was processed.

[0023] Virtual RD information storage section 134 The information on the pointer in which the address of the root directory of each session is shown is memorized, and an imagination root directory is realized to the pan of a root directory at a high order. Virtual RD Research and Data Processing Department 135 Device driver 120 A read-out session is controlled and the address of the root directory of an object session is processed. Processing session numb storage section 136 File information managerial system 130 The session number under processing is memorized and is mainly the virtual RD Research and Data Processing Department 135. It is used as a counter.

[0024] Next, actuation of the gestalt of operation of the 1st of this invention is explained. Drawing 2 is the session information processing section 123 in the gestalt of operation of the 1st of this invention. It is the flow chart showing

actuation. Moreover, drawing 3 is the flow chart showing actuation of the file information managerial system 130 in gestalt of operation of the 1st of this invention.
[0025] the actuation shown in the flow chart of drawing 2 when drawing 1 and drawing 2 are referred to -- the numb storage section 124 of CD-ROM sessions CD-ROM100 the total number of sessions -- the session information processing section 123 finishing [setting out] -- it is -- reading appearance -- carrying out -- the session number storage section 125 File information managerial system 130 or reading appearance -- carrying out -- session change software 150 finishing [setting out] -- or it is premised on being un-setting up.
[0026] Here, it investigates whether the set point is in a device driver 120. When it receives and there is a demand of the address of a root directory, it is the read-out session number storage section 125 (step 201 : a sign 201 shows amo drawing.). Suppose that it is the same as that of the following. And the read-out session number storage section 125 When there is the set point (for example, when it is one or more integers), it is the read-out session number storage section 125. The set-up session and the number storage section 124 of CD-ROM sessions It is the driver interface section 121 about the address of the root directory of the session of the direction which is the shown session and was written in previously. It minds and returns to a requiring agency (step 202).
[0027] Moreover, the read-out session number storage section 125 When there is no set point (for example, when it i 0), it is the driver interface section 121. It minds and is the number storage section 124 of CD-ROM sessions. The address of the root directory of the shown session is returned to a requiring agency (step 203).
[0028] Next, when there is a demand of the information on a root directory with reference to drawing 1 and drawing it is the processing session number storage section 136. 1 which is the value which points out the session written in f beginning No. 1 is set up, and it is a device driver 120. It orders to process the 1st session (step 301 and 302). the dri interface section 121 reading appearance -- carrying out -- the session number storage section 125 Device driver 120 after setting up 1 of an instruction from -- the address of a root directory is acquired (step 303).
[0029] this time -- the processing session number storage section 136 **** -- since 1 is set up -- device driver 120 fr -- the address of the acquired root directory -- the before session RD address storage section 133 setting up (step 304 and 305) -- the virtual RD information storage section 134 It registers (step 306). And the processing session number storage section 136 The content is incremented and it is a device driver 120. It orders to process degree session (step 307).
[0030] moreover, step 304 setting -- the processing session number storage section 136 the case where two or more a set up -- device driver 120 from -- the address of the acquired root directory, and the before session RD address stora section 133 It investigates whether the address set up is the same (step 308).
[0031] and the case where the last session is not being processed -- device driver 120 from -- since the address of the acquired root directory is the address of the root directory of the next session -- step 305 Performing henceforth is continued. moreover, the case where the last session finishes being processed -- device driver 120 from -- since the address of the acquired root directory is the address of the root directory of the last session -- step 305 henceforth -- n performing -- CD-ROM100 It investigates whether additional writing is carried out (step 309).
[0032] Here, it is CD-ROM100. When additional writing is carried out (when the set point of the processing session number storage section 136 is three or more), it is the virtual RD information storage section 134. It returns to deman registered information origin (step 310). moreover, CD-ROM100 the case (when the set point of the processing sessi number storage section 136 is 2) where additional writing is not carried out -- device driver 120 from -- it returns to information on acquired root directory demand-origin (step 311).
[0033] Next, the configuration of the 1st of one example of the gestalt of operation of this invention is explained to a detail. Drawing 4 is a drawing in which the configuration of one example of the gestalt of operation of this invention shown, and is drawing showing the outline logical format which shows the directory on [which can be added] a CD ROM medium which additional writing is carried out twice and has three sessions, and the relation of a file. Moreov drawing 5 is a drawing in which the configuration of one example of the gestalt of operation of this invention is show and is drawing which expressed the result at the time of processing drawing 4 with the tree structure.
[0034] When drawing 4 and drawing 5 are referred to, on this CD-ROM medium root directory 400 Four subdirector (SD1, SD2, SD3, SD4) 411,412,413,414 four files (A, B, C, D) 421,422,423,424 file (B) 422 Updated file (B') 441 Added file (E) 442 updated file (B') 441 Added file (E) 442 Subdirectory (SD2') 432 to point out updated subdirecto (SD2') 432 Root directory (RD') 431 to point out file (A, B', C) 421,441,423 Updated file (A', B ", C') 461,462,463 added file (F) 464 Subdirectory (SD2") 452 which points out the updated file (A', B ", C') 461,462,463 and the added file (F) 464 The root directory (RD") 451 which points out the updated subdirectory (SD2") 452 is formed.
[0035] root directory 400 **** -- two subdirectories (SD1, SD2) 411,412 The information on the pointer in which a

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location is shown is recorded. subdirectory (SD2) 412 **** -- two subdirectories (SD3, SD4) 413,414 Four files (A, C, D) 421,422,423,424 The information on the pointer in which a location is shown is recorded.
[0036] root directory (RD') 431 **** -- two subdirectories (SD1, SD2') 411,432 The information on the pointer in which a location is shown is recorded. subdirectory (SD2') 432 **** -- two subdirectories (SD3, SD4) 413,414 Five files (A, B', C, D, E) 421 and 432,423,424,442 The information on the pointer in which a location is shown is record In a root directory (RD") 451, they are two subdirectories (SD1, SD2") 411,452. The information on the pointer in which a location is shown is recorded. In a subdirectory (SD2") 452, they are two subdirectories (SD3, SD4) 413,414 and six files (A', B ", C', D, E, F) 461, 462, and 463,424,442,464. The information on the pointer in which a location shown is recorded.
[0037] next, the 1st session 470 shown in the upper right among drawing Root directory 400 Four subdirectories (SD SD2, SD3, SD4) 411,412,413,414 and four files (A, B, C, D) 421,422,423,424 a tree structure -- a table -- it is a thin the bottom.
[0038] moreover, the 2nd session 480 shown in the center of the right among drawing Root directory (RD') 431 Four subdirectories (SD1, SD2', SD3, SD4) 411,432,413,514 Five files (A, B', C, D, E) 421 and 441,423,424,442 a tree structure -- a table -- it is a thing the bottom.
[0039] furthermore, the 3rd session 490 shown in the lower right among drawing Root directory (RD") 451 Four subdirectories (SD1, SD2", SD3, SD4) 411,452,413,514 Six files (A', B ", C', D, E, F) 461, 462, and 463,424,442,46 tree structure -- a table -- it is a thing the bottom.
[0040] Next, with reference to drawing 1 , drawing 2 , drawing 3 , drawing 4 , and drawing 5 , actuation of one example of the gestalt of operation of the 1st of this invention is explained to a detail.
[0041] Drawing 5 is a drawing in which the configuration of one example of the gestalt of operation of this invention shown, and is drawing which expressed the result at the time of processing drawing 4 with the tree structure.
[0042] CD-ROM100 It is the CD-ROM medium which has the relation between the directory shown in drawing 4 , a a file and which can be added. file information managerial system 130 The file information management SI section 1 Application software 140 from -- if there is a demand of a directory and the information on a file -- RD / SD information processing section 132 The virtual RD Research and Data Processing Department 135 He leaves subsequent processing. And the virtual RD Research and Data Processing Department 135 Processing session numbe storage section 136 1 is set up and it is a device driver 120. It orders to process the 1st session (step 301 and 302). It the carrier beam driver interface section 121 about the instruction. Read-out session number storage section 125 1 is up.
[0043] After the setting out and the RD/SD information processing section 132 Device driver 120 It receives and the address of a root directory is required. Device driver 120 Driver interface section 121 When there is a demand of the address of a root directory, it is the session information processing section 123. He leaves subsequent processing. It i the carrier beam session information processing section 123 about it. It is the read-out session number storage sectio 125 first. It investigates whether there is any set point (step 201).
[0044] the number storage section 124 of CD-ROM sessions **** -- already -- the session information processing section 123 -- CD-ROM reading appearance -- carrying out -- equipment 110 from -- obtained CD-ROM100 Althou three sessions are set up reading appearance -- carrying out -- the session number storage section 125 **** -- since 1 set up -- the session information processing section 123 Driver interface section 121 It minds and is the root director 400 of the 1st session. They are RD / SD information processing section 132 about the address. It returns (step 202 a 303).
[0045] Here, it is the RD/SD information processing section 132. When the address of a root directory is acquired, h the virtual RD Research and Data Processing Department 135. Processing session number storage section 136 It investigates whether it is 1 (step 304). and the processing session number storage section 136 since setting out is 1 -- the virtual RD Research and Data Processing Department 135 RD / SD information processing section 132 from -- device driver 120 from -- root directory 400 of the 1st acquired session the address -- acquiring -- the before session RD address storage section 133 It sets up (step 305). Furthermore, the virtual RD Research and Data Processing Department 135 It is the virtual RD information storage section 134 about this address. It registers and is the process session number storage section 136. The increment of the content is carried out (step 306 and 307). (1-2)
[0046] Again, he is the virtual RD Research and Data Processing Department 135. Device driver 120 It orders to process the 2nd session (step 302). It is the carrier beam driver interface section 121 about the instruction. Read-out session number storage section 125 2 is set up. After the setting out and the RD/SD information processing section 1 Device driver 120 It receives and the address of a root directory is required.

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[0047] Device driver 120 It is the root directory 431 of the 2nd session shortly to the demand. It is the RD/SD information processing section 132 about the address. It returns (step 202 and 303). RD/SD information processing section 132 When the address of a root directory is acquired, he is the virtual RD Research and Data Processing Department 135. Processing session number storage section 136 It investigates whether it is 1 (step 304).
[0048] next time -- the processing session number storage section 136 since it is 2 -- the virtual RD Research and Da Processing Department 135 The RD/SD information processing section 132 from -- device driver 120 from -- root directory 431 of the 2nd acquired session the address -- acquiring -- the before session RD address storage section 13 It investigates whether it is the same (step 308).
[0049] the before session RD address storage section 133 **** -- root directory 400 of the 1st session since the addre is memorized -- the virtual RD Research and Data Processing Department 135 Root directory 431 of the 2nd session acquired previously the address -- the before session RD address storage section 133 It sets up (step 305). And the virtual RD Research and Data Processing Department 135 It is the virtual RD information storage section 134 about this address. It registers and is the processing session number storage section 136. The increment of the content is carried out (step 306 and 307). (2-3)
[0050] Processing performed to the 2nd session is similarly performed to the 3rd session (steps 302, 303, 304, and 308,305,306,307), and they are 4 times and the virtual RD Research and Data Processing Department 135. Device driver 120 It orders to process the 4th session (step 302). It is the carrier beam driver interface section 121 about the instruction. Read-out session number storage section 125 4 is set up. After the setting out and the RD/SD information processing section 132 Device driver 120 It receives and the address of a root directory is required. And device drive 120 Driver interface section 121 When there is a demand of the address of a root directory, it is the session informati processing section 123. He leaves subsequent processing.
[0051] It is the carrier beam session information processing section 123 about it. It is the read-out session number storage section 125 first. It investigates whether there is any set point (step 201). reading appearance -- carrying out - the session number storage section 125 ****, although 4 is set up the number storage section 124 of CD-ROM sessio **** -- already -- the number Research and Data Processing Department 123 of sessions CD-ROM reading appearan -- carrying out -- equipment 110 from -- obtained CD-ROM100 Since 3 of the number of sessions is set up Session information processing section 123 Driver interface section 121 It minds and is the root directory 451 of the 3rd session. They are RD / SD information processing section 132 about the address. It returns (step 202 and 303).
[0052] RD/SD information processing section 132 When the address of a root directory is acquired, he is the virtual RD Research and Data Processing Department 135. Processing session number storage section 136 It investigates whether it is 1 (step 304). the processing session number storage section 136 since it is 4 -- the virtual RD Research a Data Processing Department 135 The RD/SD information processing section 132 from -- device driver 120 from -- r directory 451 of the 3rd acquired session the address -- acquiring -- the before session RD address storage section 13 It investigates whether it is the same (step 308).
[0053] Before session RD address storage section 133 Root directory 451 of the 3rd session Since the address is memorized, he is the virtual RD Research and Data Processing Department 135. Processing session number storage section 136 It investigates whether it is 2 (step 309). the processing session number storage section 136 since it is 4 - RD / SD information processing section 132 The virtual RD Research and Data Processing Department 135 from -- virtual RD information storage section 134 acquiring -- the same format as a root directory -- carrying out -- the file information management SI section 131 minding -- application software 140 It returns (step 310). Application softw 140 By acquiring the above information, it becomes possible to recognize the tree structure of drawing 5 and to operate.
[0054] Next, the gestalt of operation of the 2nd of this invention is explained to a detail with reference to a drawing. Drawing 6 is the block diagram showing the configuration of the 2nd of the gestalt of operation of this invention.
[0055] At the gestalt of operation of the 2nd of this invention, it is the file information managerial system 630. File information managerial system 130 in the gestalt of the 1st operation shown in drawing 1 In a configuration Virtual R information storage section 134 Virtual RD Research and Data Processing Department 135 Instead the object Subdirectory Information storage section (henceforth the object SD information storage section) 633 a subdirectory - difference -- an information table (the following and SD -- difference -- it is called an information table) 634 a subdirectory -- difference -- the information table Management Department (the following and SD -- difference -- it called the information table Management Department) 635 The session management section 638 It differs at the poin which it has.
[0056] Object SD information storage section 633 The object SD information on the processed session is memorized

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and it is used in order to mainly ask for the difference of the object SD information for every session. SD -- differenc - information table 634 It is the table which accumulates the difference of Subdirectory Information searched for. SD difference -- the information table Management Department 635 The RD/SD information processing section 632 fro - from the acquired object SD information, it accumulates in quest of difference and it is managed. Session management section 638 Device driver 620 A read-out session is controlled.

[0057] Next, with reference to drawing 6 and drawing 7 , actuation of the gestalt of operation of the 2nd of this invention is explained. Drawing 7 is the file information managerial system 630 in the gestalt of operation of the 2nd this invention. It is the flow chart showing actuation.

[0058] In addition, the data read-out processing section 622 shown in drawing 6 and the session information process section 623 And the number storage section 624 of CD-ROM sessions The data read-out processing section 122 show in drawing 1 , and the session information processing section 123 And the number storage section 124 of CD-ROM sessions The configuration and function are the same, and explanation is omitted in order to avoid duplication.

[0059] Here, first, when drawing 6 and drawing 7 are referred to, when there are a file and a demand of the informat on a directory, it is the processing session number storage section 637. 1 which is the value which points out the sess written in for beginning No. 1 is set up, and it is a device driver 620. It orders to process the 1st session (step 701 and 702). the driver interface section 621 reading appearance -- carrying out -- the session number storage section 625 Device driver 620 after setting up 1 of an instruction from -- the address of a root directory is acquired (step 703).

[0060] this time -- the processing session number storage section 637 since 1 is set up -- device driver 620 from -- th address of the acquired root directory -- the before session RD address storage section 636 It sets up (step 704 and 70 and the RD/SD Research and Data Processing Department 632 the target subdirectory -- CD-ROM reading appearan -- carrying out -- equipment 610 minding -- CD-ROM600 from -- it searches and the information is acquired (step 70

[0061] then, step 707 setting -- the processing session number storage section 637 the case where two or more are se up -- CD-ROM600 from -- the information on the searched subdirectory, and the object SD information storage sect 633 difference with the information memorized -- asking -- SD -- difference -- information table 634 It registers (step 708). Moreover, the processing session number storage section 637 It is step 708 when 1 is set up. It does not carry o and CD-ROM600 from -- the information on the searched subdirectory -- the object SD information storage section 633 memorizing (step 709) -- the processing session number storage section 637 the content -- incrementing -- devic driver 620 It orders to process degree session (step 710 and 702).

[0062] moreover, step 704 setting -- the processing session number storage section 637 the case where two or more a set up -- device driver 620 from -- the address of the acquired root directory, and the before session RD address stora section 636 It investigates whether the address set up is the same (step 704 and 711).

[0063] and the case where the last session is not being processed -- device driver 620 from -- since the address of the acquired root directory is the address of the root directory of the next session -- step 705 Performing henceforth is continued. moreover, the case where the last session finishes being processed -- device driver 620 from -- since the address of the acquired root directory is the address of the root directory of the last session -- step 705 henceforth -- n performing -- CD-ROM600 It investigates whether additional writing is carried out (step 712).

[0064] and CD-ROM600 the case where additional writing is carried out (three or more have been the processing session number storage section 637) -- SD -- difference -- information table 634 from -- the difference of the target subdirectory -- information -- searching -- the object SD information storage section 633 It merges (step 713). (merg Moreover, CD-ROM600 Additional writing is not carried out (the processing session number storage section 637 is A case is step 713. It does not carry out. To the last, it is the object SD information storage section 633. The memori content is returned to information demand-origin (step 714).

[0065] Next, the configuration of the 2nd of one example of the gestalt of operation of this invention is explained to detail. the drawing which drawing 8 shows the configuration of one example of the gestalt of operation of this invention -- it is -- SD of drawing 6 -- difference -- information table 634 It is outline logical format drawing showin the content. Moreover, drawing 9 is a drawing in which the configuration of one example of the gestalt of operation this invention is shown, and is drawing which expressed the result at the time of processing drawing 4 with the tree structure.

[0066] if it combines with drawing 4 and drawing 8 and drawing 9 are referred to -- SD -- difference -- information table 810 It is in the condition immediately after processing the 1st session, and has no information. and SD -- difference -- information table 820 the condition immediately after processing the 2nd session -- it is -- subdirectory (SD2) 412 Subdirectory (SD2') 432 the subdirectory (SD2) which memorizes difference -- difference 821 it registers

having -- a subdirectory (SD2) -- difference 821 **** -- file (B) 422 The information on the pointer in which a locat is shown is recorded.

[0067] SD -- difference -- information table 830 It is in the condition immediately after processing the 3rd session. Subdirectory 412 (SD2) Subdirectory 432 (SD2') It doubles with difference. further -- subdirectory (SD2") 452 the subdirectory (SD2) which memorizes difference -- difference 831 it registers -- having -- a subdirectory (SD2) -- difference 831 **** -- File 421,422,441,423 (A, B, B', C) The information on the pointer in which a location is show is recorded.

[0068] Next, with reference to drawing 4 , drawing 6 , drawing 7 , drawing 8 , and drawing 9 , actuation of one example of the gestalt of operation of the 2nd of this invention is explained to a detail.

[0069] file information managerial system 630 The file information management SI section 631 Application softwar 640 from -- if there is a demand of the information on a subdirectory "SD2" -- the RD/SD information processing section 632 The session management section 638 He leaves subsequent processing. And the session management section 638 Processing session number storage section 637 1 is set up and it is a device driver 620. It orders to proce the 1st session (step 701 and 702).

[0070] It is the carrier beam driver interface section 621 about the instruction. Read-out session number storage secti 625 1 is set up. after the setting out and the RD/SD information processing section 632 Device driver 620 from -- roo directory 400 of the 1st session The address is acquired (step 703). RD / SD information processing section 632 Whe the address of a root directory is acquired, it is the session management section 638. Processing session number stora section 637 It investigates whether it is 1 (step 704).

[0071] the processing session number storage section 637 since it is 1 -- the session management section 638 RD / S information processing section 632 from -- device driver 620 from -- root directory 400 of the 1st acquired session th address -- acquiring -- the before session RD address storage section 636 It sets up (step 705). and the RD/SD information processing section 632 Subdirectory (SD2) 412 of the 1st session CD-ROM600 from -- searching -- the information -- acquiring -- the session management section 638 The processing session number storage section 637 I made to check whether it is 1 (step 706 and 707).

[0072] the RD/SD information processing section 632 The processing session number storage section 637 since it is - step 708 processing -- not carrying out -- SD -- difference -- the information table Management Department 635 receiving -- CD-ROM600 from -- subdirectory (SD2) 412 of the 1st acquired session information -- the object SD information storage section 633 It orders to make it memorize (step 709). In response, it is the session management section 638. Processing session number storage section 637 The increment of the content is carried out (1-2), and it i device driver 620 again. It orders to process the 2nd session (step 710 and 702).

[0073] It is the carrier beam driver interface section 621 about the instruction. Read-out session number storage secti 625 2 is set up. after the setting out and the RD/SD information processing section 632 Device driver 620 from -- roo directory 431 of the 2nd session The address is acquired (step 703). RD/SD information processing section 632 Whe the address of a root directory is acquired, it is the session management section 638. It investigates whether the processing session number storage section 637 is 1 (step 704).

[0074] next time -- the processing session number storage section 637 since it is 2 -- the session management section 638 RD / SD information processing section 632 from -- device driver 620 from -- root directory 431 of the 2nd acquired session the address -- acquiring -- the before session RD address storage section 636 It investigates whether is the same (step 711). the before session RD address storage section 636 **** -- root directory 400 of the 1st sessio since the address is memorized -- the session management section 638 Root directory 431 of the 2nd session acquire previously the address -- the before session RD address storage section 636 It sets up (step 705).

[0075] and the RD/SD information processing section 632 Subdirectory (SD2) 432 of the 2nd session CD-ROM600 from -- searching -- the information -- acquiring -- the session management section 638 The processing session numb storage section 637 It is made to check whether it is 1 (step 706 and 707).

[0076] RD/SD information processing section 632 Processing session number storage section 637 Since it is 2 SD -- difference -- the information table Management Department -- CD-ROM600 from -- subdirectory (SD2) 432 of the 2 acquired session With information it registers with the object SD information storage section 633 -- making (a registration result) Subdirectory (SD2) 412 of the 2nd session memorized difference with information -- SD -- difference -- information table 634 SD of drawing 8 -- difference -- table 820 reference -- further -- subdirectory (SD 412 of the 2nd session information -- the object SD information storage section 633 It is made to memorize (step 708 and 709).

[0077] And the session management section 638 Processing session number storage section 637 The increment of th

h g cg b eb cg e e

content is carried out (step 710). (from 2 to 3) Processing performed to the 2nd session is similarly performed to the session (step 702 - step 710), and they are 4 times and the session management section 638. Device driver 620 It ord to process the 4th session (step 702). It is the carrier beam driver interface section 621 about the instruction. Read-ou session number storage section 625 4 is set up. after the setting out and the RD/SD information processing section 63 Device driver 620 from -- root directory 451 of the 3rd session The address is acquired (step 703).

[0078] RD / SD information processing section 632 When the address of a root directory is acquired, it is the session management section 638. Processing session number storage section 637 It investigates whether it is 1 (step 704). th processing session number storage section 637 since it is 4 -- the session management section 638 The RD/SD information processing section 632 from -- device driver 620 from -- root directory 451 of the 3rd acquired session t address -- acquiring -- the before session RD address storage section 636 It investigates whether it is the same (step 711).

[0079] Before session RD address storage section 636 Root directory 451 of the 3rd session Since the address is memorized, it is the RD/SD information processing section 632. Session management section 638 Processing session number storage section 637 It is made to check whether it is 2 (step 712). the processing session number storage sect 637 since it is 4 -- the RD/SD information processing section 632 SD -- difference -- the information table Managem Department 635 SD -- difference -- the difference of the subdirectory of the information table 634 (the content of registration SD of drawing 8 difference the table 830 reference) to the object -- information is retrieved -- making -- object SD information storage section 633 It is made to merge (step 713).

[0080] the last -- the RD/SD information processing section 632 SD -- difference -- the information table Manageme Department 635 from -- the object SD information storage section 633 the memorized content -- acquiring -- the file information management SI section 631 minding -- application software 640 It returns (step 714). Application softw 140 By acquiring the above information, it becomes possible to recognize the tree structure shown in drawing 9 , and operate.

[0081]

[Effect of the Invention] As explained above, in this invention, read the address of the root directory of all sessions with the virtual RD Research and Data Processing Department and the before session RD address storage section, an read by the session number storage section, and it accumulates in the virtual RD information storage section. Withou adding modification of what to application software and CD-ROM read-out equipment, in order to provide applicatio software with it What was written in the point of the file by which additional writing was carried out by the same identifier, and the thing written in behind can be read to the CD-ROM medium which can be added.

[0082] Carry out reading appearance to an information table and the session management section, and reading appearance is carried out by the session number storage section. furthermore, the information on the object SD of all sessions -- SD -- difference -- the information table Management Department and SD -- difference -- In order to accumulate it in the object SD information storage section, to show it as one subdirectory and to provide application software with it, What was written in the point of the file by which additional writing was carried out by the same identifier, and the thing written in behind can be read to the CD-ROM medium which can be added, without adding modification of what to application software and CD-ROM read-out equipment. Moreover, it necessarily looks physically neither from the same directory nor the subdirectory of plurality [file] in that case.

[Translation done.]